



Syzygium malaccense (Malay apple)

Myrtaceae (myrtle family)

acpubl (Kosrae); *'abi'a* (Societies); *apel* (Pohnpei); *arfathl*, *harafath*, *faliap*, *faliyap* (Yap); *faariyap*, *fasniyaap*, *feniyap* (Chuuk); *fekakai* (Niue); *fekika kai* (Tonga); *jambosier rouge* (French); *ka'ika* (Cooks); *kafika* ('Uvea, Futuna); *kavika* (Fiji); *ke'ika* (Mangareva); *kehi'a* (Southern Marquesas); *kehika*, *kehika inana* (Northern Marquesas); *kidel* (Palau); *makupa* (Guam); Malay apple, mountain apple (English); *nonu fi'afi'a* (Samoa); *'obi'a 'ai*, *'obi'a* (Hawai'i)

W. Arthur Whistler and Craig R. Elevitch

IN BRIEF

Distribution Throughout the tropics, but especially in Indo-Malaya, Southeast Asia, Melanesia, Polynesia, and Micronesia.

Size Medium tree typically 5–12 m (16–40 ft) in cultivation.

Habitat Humid and subhumid tropics, usually found sea level to 600 m (1970 ft).

Vegetation Associated with a wide range of species worldwide.

Soils Wide range of types from sand to heavy clay (not on atolls).

Growth rate Moderate, 0.6–1 m/yr (2–3 ft/yr) for the first few years.

Main agroforestry uses Homegardens.

Main products Fruit, medicinal, ornamental.

Yields 21–85 kg (48–188 lb) fruit per tree, for eating fresh.

Intercropping Compatible with many species and does well mixed with many other species in homegardens.

Invasive potential Although it is not considered invasive, it has naturalized in localized areas where it was introduced.



PHOTO: C. ELEVITCH

Malay apple, North Kona, Hawai'i.

INTRODUCTION

The Malay apple is a medium-size tree that has been cultivated for a long time in the tropics. Its native range is thought to lie somewhere between Melanesia and South-east Asia, but exactly where is not known. It was originally found in lowland to montane rainforest. Today, over most of its range it is found in homegardens and plantations, although rarely in montane forest. In a few places where it was introduced (e.g., Hawai'i), it is found in native forest as relictual stands from which it does not spread (no local birds can disperse the fruit). Because of its large fruit and seed, it is rarely invasive but may persist in groves that were formerly planted in native forest. The tree is valued for its large edible fruits that are eaten fresh. Because of its fruits seasonality and short shelf life, it has not been grown in large plantations for export and is thus mostly locally consumed rather than exported. It can be a significant cash crop, however, when sold in local markets. Thus it is ideal for homegardens and casual intercrop plantings. It thrives in areas with sufficient year-round rainfall and can be irrigated in areas with a dry season. The tree is also widely used in traditional medicines. The wood is of average quality but is little used because of the availability of better timber species.

DISTRIBUTION

Native range

It has been cultivated for so long that its origin is uncertain. However, it is native to somewhere in the Indo-Malayan region or Southeast Asia, probably originally in lowland rainforest.

Current distribution

It is now cultivated throughout the tropics, especially in Indo-Malaysia, Southeast Asia, Melanesia, Polynesia (where it was an ancient introduction as far east as Hawai'i), and Micronesia (where it is apparently a modern introduction in the eastern part of its range, Pohnpei and Kosrae). In some places, such as in Melanesia (e.g., Vanuatu and Fiji), it appears to be naturalized. In Hawai'i, it is common in forest groves that are probably remnants of former cultivation, but the tree does not readily spread from these.

BOTANICAL DESCRIPTION

Preferred scientific name

Syzygium malaccense (L.) Merr. & Perry

Family

Myrtaceae (myrtle Family)

Non-preferred scientific names

Eugenia malaccense L.

Jambosa malaccensis (L.) DC.

Common names

Pacific islands:

acpuhl (Kosrae)

'ahi'a (Societies)

apel (Pohnpei)

arfathl, harafath, faliap, faliyap (Yap)

faariyap, fasniyaap, feniyaap (Chuuk)

fekakai (Niue)

fekika kai (Tonga)

jambosier rouge, poire de Malaque, pomme Malac, pomme de Malaisie, pomme de Tahiti (French)

ka'ika (Cooks)

kafika ('Uvea, Futuna)

kavika (Fiji)

ke'ika (Mangareva)

kehi'a (Southern Marquesas)

kehika, kehika inana (Northern Marquesas)

kidel (Palau)

makupa (Guam)

Malay apple, mountain apple (English)

nonu fi'afi'a (Samoa)

'ohi'a 'ai, 'ohi'a, 'ohi'a 'ai ke'oke'o, 'ohi'a hakea, 'ohi'a kea, 'ohi'a leo, 'ohi'a 'ula (Hawai'i)

Size

It grows up to 16 m (53 ft) or more in height but is often only 5–12 m (16–40 ft) when grown in cultivation.

Form

The crown is oblong, pyramidal, or cylindrical, sometimes sub-tiered, with many small horizontal to ascending branches. The bole is short and often fluted.

Flowers

An inflorescence of short, few-flowered cymes up to 6 cm (2.4 in) long is borne on the trunk or older branches. Calyx turbinate, 1.2–1.8 cm (0.5–0.7 in) long, notched to form 4 pale yellow, rounded lobes 4–6 mm (0.2–0.3 in) long. Corolla with 4, red or pink (rarely white), suborbicular petals 7–11 mm (0.3–0.4 in) long, early caducous. Ovary inferior, style long, with a simple style up to 2.5 cm (1 in) long. Stamens many (ca. 200), free, red, 1–2 cm (0.4–0.8 in.) long.

Flowering is usually seasonal, from 1–2 months in dura-

tion, but it varies widely from place to place and even from year to year. In some areas, Malay apple flowers two or three times per year. It occurs mostly in the spring (August–November) in the South Pacific, but from May–February in Fiji, in February and from June–October in Vanuatu, and from May–June on Java. In Hawai‘i, lying north of the equator, it flowers from March–April, and in Pohnpei flowering apparently occurs twice a year, in November–December, and again in April–May. Trees begin flowering at an age of 7–8 years.

Leaves

Leaves are opposite, simple, blade ovate to oblong, mostly 10–30 cm (4–12 in) long, often affected by insect galls, acute to rounded at the base, acute to acuminate at the tip; leaf surfaces are glabrous, glossy green with entire margins and a thick, red petiole 2–10 mm (0.1–0.4 in) long.

Fruit

Fruit a large, fleshy, ovoid berry 3–7 cm (1.2–2.8 in) long, glossy red or sometimes white or white with red streaks. Like flowering, fruiting is variable. In the South Pacific, it usually occurs in late spring to summer (November–February), but from September–May in Vanuatu, and from August–September in Java. In India, the main crop occurs from May–July and there is often a second crop in November and December. In Hawai‘i, fruiting occurs in June to November or even December, and in Pohnpei in January–February and June–December. Latitude and local climate may be the major determinants of flowering time. Fruits mature in 60 days from the full opening of the flowers and fall quickly once fully ripe. Ripened fruit deteriorate rapidly. The trees can produce fruit within 5 years after planting.

Seeds

Each fruit contains a single large, subglobose seed or a pair of subglobose to hemispherical seeds 1.6–2 cm (0.6–0.8 in) in diameter, light-brown externally, green internally, and somewhat meaty in texture. The fruits of some trees are entirely seedless. In its native range, the seeds are probably dispersed by birds (particularly pigeons), who eat the fruit, and also by



Flower buds, flowers, and ripening fruit. PHOTOS: C. ELEVITCH

fruit bats. Where suitable dispersers are absent, the tree disperses poorly, probably not spreading far from the parent tree (and hence is not naturalized in these areas).

Rooting habit

No information available.

Similar species/look-a-likes

It is similar to *Syzygium aqueum* (bell or water apple), a tree cultivated in the Pacific for its edible fruits. The fruits of this species, however, are smaller and bell-shaped (widest toward the free end), and the flowers are white rather than red. It is also similar to *Syzygium samarangense*, a tree sometimes cultivated in the Pacific and becoming naturalized in native forests. The flowers of this tree are white and the leaves are subsessile (i.e., having the petioles less than 7 mm [0.25 in] long). All three species are used interchangeably where they occur together. *Syzygium malaccense* also differs from the other two by typically having the inflorescences borne on the branches and occasionally on the trunk rather than at or near the ends of the stems.

GENETICS

Known varieties

Two color forms exist over most of its range, the common one with red fruits and flowers, and a less common one with white fruits and flowers. These have not been given taxonomic rank, but in Polynesia and Melanesia they are recognized in the local languages (usually with a color qualifier added to the native name). Some commercial companies recognize many selected clones. Trees of selected varieties are available from local tropical fruit nurseries, especially in south Florida.

Culturally important related species in the genus

Many native trees belonging to the genus *Syzygium* are found on the high islands of the tropical Pacific, some of them important timber species. Two other species are cultivated in western Polynesia (and native to Fiji), *Syzygium corynocarpum* and *Syzygium neurocalyx*. The seasonal fruits of these two species were once commonly used for personal adornment (i.e., for making fragrant leis) and sometimes for scenting coconut oil.

ASSOCIATED PLANT SPECIES

Malay apple does not have any specific associates, as it occurs over such a wide geographical area, each with its own flora. However, it is typically grown in mixed plantings in

and around villages together with other cultivated species, such as coconut, banana, breadfruit, etc.

Associated species commonly found in native habitats

Not usually found in native forest, but when it is, it occurs with numerous species.

Species commonly associated as aboriginal introductions in Pacific islands

Several other fruit trees were aboriginal introductions into the Pacific islands (Polynesia at least). These include Tahitian chestnut (*Inocarpus fagifer*), breadfruit (*Artocarpus altilis*), and Polynesian plum (*Spondias dulcis*).

ENVIRONMENTAL PREFERENCES AND TOLERANCES

Climate

The tree thrives in cultivation in volcanic soil with sufficient year-round rain in the humid and subhumid tropics. It does not do well on atolls, either because of the calcareous soil or insufficient rainfall. The tree is restricted to the tropics, being intolerant of any frost. Hence, it is found only in tropical regions. It does well at cool elevations, as at higher elevations in Hawai'i, either planted around houses, where it can be watered during dry periods, or in mountain forests where there is sufficient natural rainfall.

Elevation range

The tree can grow from near sea level to 1200 m (4000 ft) but is usually found below 600 m (2000 ft).

Mean annual rainfall

The lower rainfall range is 1500 mm (60 in), and there is no upper limit.

Rainfall pattern

It prefers year-round rain but can tolerate seasonal rain as long as there is no extended dry period. Trees grown in areas with a seasonal dry period need to be irrigated during the drought.

Mean annual temperature

24°–27°C (75–81°F) (estimate)

Minimum temperature tolerated

It is intolerant of frost.

Soils

The tree grows vigorously on a range of soil types from sand to heavy clay. It tolerates moderately acid soil but in high pH soil it develops nutritional deficiencies that can be overcome with the occasional use of micronutrient sprays. It does not do well in highly alkaline situations. In India, the tree reportedly grows best on the banks of ponds, lakes, and streams where there is good drainage.

Soil texture

It tolerates medium to heavy texture soils (loams, sandy clay loams, sandy clays, clay loams, and clays).

Soil drainage

It grows in soils with free drainage.

Soil acidity

pH 6.1–7.4

Special soil tolerances

None known.

Tolerances

Drought

It does not do well in areas with a seasonal drought, unless it is irrigated during the dry season or grows near a water body. Established trees can tolerate more extensive periods of drought, up to 6 months. Significant leaf fall occasionally occurs, although the tree will not totally defoliate.

Full sun

The tree grows well in full sun if given enough water.

Shade

Partial shade is tolerated.

Fire

It is probably not adapted to fire, as it is native to wet tropical rainforest, which is not subject to fire.

Frost

The tree is intolerant of frost.

Waterlogging

The tree does not tolerate waterlogging. Where it is grown in wet places (such as the banks of irrigation canals), it is usually put in mounds or other slight elevations to keep the roots from being in waterlogged soil for prolonged periods of time.

Salt spray

It is not known to be tolerant of salt spray.

Wind

It does not do well in strong wind because of its fragile wood, according to some sources, but others note that the “trees are quite wind resistant.” The tree has been used in windbreaks.

GROWTH AND DEVELOPMENT

When grown from seed, germination occurs in 4–6 weeks. The trees grow fast when weeded and mulched during the first year or two. After 5 years, faster growing individuals can start producing fruit.

Growth rate

There is no data available, but growth rate is moderate even in early years, likely less than 75 cm (30 in) per year.

Reaction to competition

The tree is tolerant of competition, as it thrives in old forest but does best when periodically weeded when young.

PROPAGATION

The seeds germinate well, and many can usually be found sprouting under their parent tree. While seed propagation is common, air-layering has been successfully used, and cuttings have been rooted in sand in Hawai‘i. These vegetative methods of reproduction are used especially on high yielding individuals. Some people prefer to graft superior varieties onto seedling stocks.

Propagation from seed

(after Wilkinson and Elevitch 2003)

Seed collection

Seeds are best collected during the fruiting season, which varies from place to place. They have short viability, so they should be taken from the fruit and planted right away. The most readily available supply of seeds is found under cultivated trees. Seeds should be collected from individual trees with the most desirable fruits.

Seed preparation

No special preparation is needed for the seeds. It is best to remove most of the flesh in order to minimize fungal attacks. This can be easily done by lightly rubbing the seeds together in water. No pretreatment is needed prior to sowing.



Ripe fruit cut in half to show fleshy seed inside. PHOTO: C. ELEVITCH

Seed storage

The seeds are fleshy and do not retain viability when stored or dried. Because of their short viability, they should be planted straight out of the fruit. If necessary, seeds can be stored 2–3 weeks wrapped in a lightly moistened medium such as paper towel and kept in a cool, dark place.

Media

When growing seedlings in containers, use a well drained potting medium such as 50% coarse peat moss, 25% perlite, and 25% vermiculite amended with a little compost, dolomite lime, gypsum, micronutrients, and slow release 14-14-14 fertilizer. Also, natural soils mixed with sand, volcanic cinders, or composted organic matter can be used for seedling production, although these may contain live weed seeds that increase maintenance in the nursery.

Growing area

Full sun or light shade are recommended. As seeds readily germinate under fruiting trees, seedlings can also be grown in deep shade, although growth will be slower. Seeds can be grown in containers in the nursery or sown directly in the field.

Germination

Seeds are planted no more than 4 cm (1.5 in) deep in nurseries or directly in the field. The seeds will germinate in 4–6 weeks. The germination rate is high for fresh seed (and, indeed, prolific under trees in the wild).

Time to outplanting

If seedlings are grown in containers rather than directly in the field, the seedlings are typically transplanted to their final destination when 8 months old.

Size at outplanting

The size at outplanting is ideally 35 cm (1 ft) or larger.

Vegetative propagation

While seed propagation is common, superior types are multiplied vegetatively. Air-layering and cuttings are both successful methods. Air-layering is best carried out on young branches 1–2 years old. A branch diameter of 1–2 cm (0.4–0.8 in) and length of 30–45 cm (12–18 in) are ideal. Pick branches that are easy to access, and preferably with stems that are shaded by other branches. Air-layering works well any time of year, but the mother plant should be in good health and have adequate water and nutrition available. Cuttings have been successfully rooted in sand in Hawai'i. Cuttings are ready for transplanting 6 weeks after rooting.



Seedling ready for outplanting. PHOTO: C. ELEVITCH

DISADVANTAGES

The fruit is only slightly sweet, although it makes a refreshing snack when picked and eaten out-of-hand. The fruit is crisp, delicate, and rather watery, with a very short shelf life, and is therefore difficult to market commercially. It is rarely grown in commercial plantations, but mostly as a tree or two in homegardens or plantations. The fruit does not make very good jams, because most of the taste is lost during preservation.

Potential for invasiveness

In most places where it has been introduced it is unable to spread. It is not considered invasive, although it has naturalized in isolated areas where it was introduced.

Diseases and pests

The tree is fairly resistant to pests. The trees are frequently attacked by termites in India. It is reported that sap-feeders, defoliators, miners, and borers have been found on the foliage and on dead stems. Native fruit flies attack the tree in Vanuatu, but otherwise very little is known about this, because the tree has not been a major commercial crop. In Hawai'i, rose beetles often attack the foliage of young trees, which can suppress early growth. Rose beetle attacks usually diminish in older trees.

Host to crop pests/pathogens

Not known as a host for pests.

AGROFORESTRY/ENVIRONMENTAL PRACTICES

Crop shade/overstory

Not reported to be used for this, however it is frequently found in and among numerous crops in homegardens.

Homegardens

It is commonly used in homegardens, being planted around houses and in plantations.

Windbreaks

Malay apple has been used in windbreaks.

Native animal/bird food

The tree has fruit that is edible by birds. It is also a food source for fruit bats during its fruiting times.

Ornamental

The tree is quite attractive and highly ornamental, especially when in bloom, and it makes a nice shade tree.



Fruit of white-fruited type. PHOTO: C. ELEVITCH

USES AND PRODUCTS

The Malay apple was brought to the Pacific islands by early inhabitants and was one of the few fruit trees available to them. It was once an important supplemental (and seasonal) fruit crop. Today, because other more prolifically fruiting and better tasting fruits are available (e.g., mango and papaya), cultivation of Malay apple has decreased. However, it is still a useful crop and is easily cared for in a homegarden. The wood is average but little utilized since other better woods were and are available.

Fruit

The ripe fruit is eaten raw. The skin is thin and the flesh is crisp and white. The slightly sweet taste is refreshing and can be a crunchy addition to a mixed fruit salad. Although not suited for jams or jellies, the half-ripened fruit can be pickled. Pickled or preserved slices and sauces, very heavily spiced, are found in southeast Asia. Wine is made from the fruit in Puerto Rico.

Medicinal

In Samoa an infusion of the crushed leaves or scraped bark is very commonly taken as a potion, the leaves are chewed and the juice swallowed, or the leaf juice is dripped into the mouth of an infant to treat mouth infections. In Tonga an extract of bark scrapings is commonly administered to treat throat infections and stomachache, and is an ingredient in various remedies for a complex of abdominal ailments known as kahi. An infusion of the bark is used to treat coughs in Futuna and Niue. In the Cook Islands a solution of the crushed leaves, or to a lesser extent the grated bark, is widely used to treat thrush, and a solution of the grated bark is sometimes administered as an emetic. Various uses, some of them as a purgative, are reported in Tahiti, few if any of them dealing with children's mouth

infections. In the Marquesas coconut oil in which fragments of the bark have been soaked is taken as a purgative. In Hawai'i the bark was crushed and its juices taken for sore throat, juice extracted from the bark was mixed with salt and applied to cuts, and the leaves were crushed and ingested for bronchitis. The use of the plant for treating mouth infections such as thrush is reported from as far away as Indonesia and is likely to be an ancient Polynesian practice. In Malaysia the powder from the dried leaves is reportedly used on a cracked tongue, a preparation of the root is a remedy for itching, and a preparation of the root is given to alleviate swelling. The root bark is used to treat dysentery and serves as an emmenagogue (promoting menstrual function) and abortifacient. Cambodians reportedly take a decoction of the fruit, leaves, or seeds as a febrifuge (against fever). In Brazil various parts of the plant are used as remedies for constipation, diabetes, coughs, pulmonary catarrh, headache, and other ailments. Numerous other uses are reported over the range of the species.

Beautiful/fragrant flowers

The flowers are very attractive but fragile and not easily used. After picking, they soon shed numerous red stamens. Early sources in Fiji noted "the natives gathering handfuls of them [the showy red stamens] to strew on their heads." In Hawai'i both blossoms and fruit were used to make leis.

Timber

The reddish, soft to hard, tough and heavy timber is difficult to work, as it is inclined to warp. However, it is sometimes employed for construction as house posts, fence posts, raf-

ters, railway ties, and for carving bowls. In Chuuk it has been used to make outrigger booms.

Craftwood

In Hawai'i the wood was considered sacred and carved into religious images.

Fuelwood

Occasionally used for firewood, the tree is not usually so utilized, especially if the tree still is producing fruits.

Canoe/boat/raft making

The wood is used to make outrigger booms in Chuuk.

URBAN AND COMMUNITY FORESTRY

Because of its beauty, low demand for care, and abundant, refreshing fruit, Malay apple is well suited for urban environments. The tree was widely introduced into Pacific islands by native people and integrated into their homegardens, medicine, and spiritual beliefs. Planting and preserving this tree in urban environments forms a living connection to aboriginal cultures.

Size in an urban environment

Malay apple typically reaches 5–12 m (16–40 ft). Pruning can control the tree's size, although heavy pruning can kill the tree.

Rate of growth in a landscape

The rate of growth is moderate, about 75 cm (30 in) per year in height. In the most favored environments, such as low elevation and moist valleys, it may grow faster.

Root system

There is no information available, but it is unlikely the tree would cause problems with pavement.

Products commonly used in a Pacific island household

The fruit is best to eat freshly picked from the tree, which makes the tree ideal for homegardens. It is also used for a multitude of home remedies.

Light requirements

The tree prefers full sun but it can grow well with light shade, especially if the shade is from the side rather than overhead.

Nutritional Analysis (after Morton 1987)

	Per 100 g of Edible Portion
Moisture	90.3–91.6 g
Protein	0.5–0.7 g
Fat	0.1–0.2 g
Fiber	0.6–0.8 g
Ash	0.26–0.39 g
Calcium	5.6–5.9 mg
Phosphorus	11.6–17.9 mg
Iron	0.2–0.82 mg
Carotene	0.003–0.008 mg
Vitamin A	3–10 I.U.
Thiamine	15–39 mcg
Riboflavin	20–39 mcg
Niacin	0.21–0.40 mg
Ascorbic Acid	6.5–17.0 mg

Water/soil requirements

It grows in a wide range of soils but requires free drainage. It grows best in moist valleys, along waterways, and in other situations where soil moisture is high. In urban environments, areas with roof or gray-water run-off may be preferred.

Life span

The longevity is unknown, although several decades is expected.

Varieties favored for use in homegardens or public areas

There are two color forms, red and white, both of which are grown in homegardens. Trees with large and especially sweet fruit are sometimes cloned by cutting or air-layering.

Exceptional ornamental values

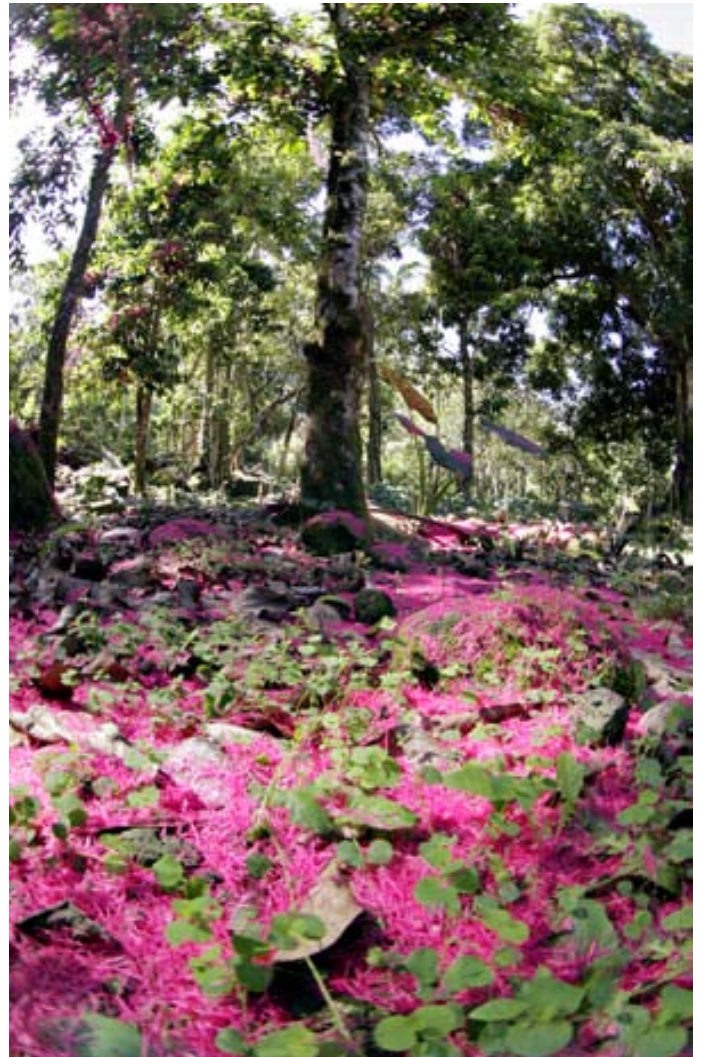
The tree flowers abundantly as many as three times per year, filling the trunk and inner part of large branches with bright red or white, mildly fragrant flowers, which can be seen through openings in the canopy. Each flowering period lasts about 2 weeks, leaving the ground under the tree temporarily carpeted in red or white.

Use as living fence, hedge or visual/noise barrier

Because of its irregular canopy and slow regrowth after pruning, Malay apple is rarely used for these purposes. It is, however, used in multi-row, multi-species windbreaks that take up more space than usually available in urban environments.

Birds/wildlife

Many birds enjoy eating the ripe fruit, both on the tree



The brief flowering period is followed by a colorful carpet of flower stamens under the tree. PHOTOS: C. ELEVITCH

and after falling to the ground. Pigs most certainly will eat fallen fruit.

Maintenance requirements

Once established, the tree rarely requires any special care. Mulching with organic materials, such as grass clippings or other plant foliage (shredded or not), will help conserve soil moisture while slowly releasing nutrients into the soil.

Nuisance issues

Fruits drop quickly after ripening and attract rats and fruit flies. If the juicy fruits are allowed to ripen and fall to the ground, the tree could be considered “messy.” The fruit decomposes rapidly, and usually there are no offensive associated smells or other problems.

Hazards

None.

Common pest problems

Serious pest problems are rare. In Hawai‘i, rose beetles commonly feed on young trees, defoliating them periodically. Without leaves, the tree’s growth is slowed. Once trees reach 5–7 years, problems with rose beetles usually disappear. Keeping young trees healthy by mulching and ensuring continual soil moisture will help them recover from rose beetle attacks.

COMMERCIAL PRODUCTS

The tree is primarily important as a supplemental fruit crop. The fruit is mostly consumed raw and locally rather than being exported. For marketing, the ripe fruits must be hand-picked to avoid damage and to have a longer shelf-life. However, because the fruit is seasonal and somewhat insipid, it is best eaten immediately after harvest and does not have much commercial value other than being sold in local marketplaces during the fruiting season. The wood is of some value but is not used commercially.

Spacing for commercial production

In India, commercial trees are spaced 6–10 m (20–33 ft) apart in fields prepared and enriched as for any other crop, and thereafter they require little care except for elimination of weeds, periodic fertilization, and plentiful irrigation in very dry weather. However, the Malay apple is usually grown in homegardens mixed with other species.

Management

Weeding needs to be done only during the early stages

of growth. The tree can be pruned to ensure that fruit is borne low for ease of picking. However, the tree regrows only weakly from pruning, and heavy pruning can kill the tree.

Advantages and disadvantages of polycultures

It does well mixed with other species and is not usually grown in monocultures.

Estimated yields

Yields of 21–85 kg (48–188 lb) per tree have been reported.

On-farm processing methods required to access market

Because of its short shelf life and fragile skin, the fruit is not very suitable for markets, except at the local level. The sooner the fruit is chilled, the longer the shelf life; chilled soon after harvest, the shelf life may be extended from 2 days to a week.

On-farm processing methods

In ancient Hawai‘i the fruit was partially dried for palatability and storage.

Markets

It is rarely exported, except to cities near where the trees are grown (e.g., in Singapore).

INTERPLANTING/FARM APPLICATIONS

Malay apple is often planted in and among other trees such as citrus, coffee, macadamia nuts, etc. It is a good fruit for eating while working in the field. By planting at various elevations on a farm, the season fruits are available can be extended by several weeks.

PUBLIC ASSISTANCE AND AGROFORESTRY EXTENSION

Extension offices for agroforestry and forestry in the Pacific:
<http://www.traditionaltree.org/extension.html>

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Malay apple grows well in mixed plantings, here surrounded by breadfruit, ti, coffee, and coconut. PHOTO: C. ELEVITCH

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Traditional Tree Initiative—Species Profiles for Pacific Island Agroforestry (www.traditionaltree.org)

Syzygium malaccense (Malay apple)

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